

I/We Claim:

1. A computer readable medium storing computer executable instructions for graphically depicting weather defined in a pre-existing weather profile to a simulated geographical environment in a computer game, comprising:

- a) reading a data structure storing predefined location neutral weather information, wherein the data structure comprises weather information for each of a plurality of cells in a multi-dimensional array;
- b) applying the weather information read from the data structure to a grid within the simulated geographical environment of the computer game based on a user's starting position within the computer game; and
- c) graphically depicting weather in the computer game based on a current position of the user within the grid.

2. The computer readable medium of claim 1, wherein the weather information for each cell comprises a plurality of layers of weather information.

3. The computer readable medium of claim 2, wherein the layers are selected from a set of layer types including a surface conditions layer, a cloud layer, a temperature layer, a wind layer, and a visibility layer.

4. The computer readable medium of claim 3, wherein the weather information for a first cell comprises a plurality of layers including at least two layers of a same layer type.

5. The computer readable medium of claim 1, wherein the multi-dimensional array is a two-dimensional array.

6. The computer readable medium of claim 1, wherein each cell of the multi-dimensional array corresponds to a geographical area of predetermined size.

7. The computer readable medium of claim 6, wherein each cell of the multi-dimensional array corresponds to a square geographical area of 256 km².

8. The computer readable medium of claim 1, wherein the multi-dimensional array comprises a three dimensional array, wherein the first and second dimensions correspond to geographic location, and the third dimension corresponds to time.

9. The computer readable medium of claim 8, wherein step c) comprises transitioning the graphically depicted weather within the computer game from the weather information stored in each cell in a first level of the third dimension to the weather information stored in each cell in a second level of the third dimension.

10. The computer readable medium of claim 9, wherein each layer of the multi-dimensional array in the third dimension has a specified elapsed time value, and wherein the transitioning occurs over an amount of time corresponding to the elapsed time value.

11. A data structure stored on a computer readable medium, said data structure identifying weather for simulation in a computer game, comprising:

for each of a plurality of cells in a first two-dimensional grid, a first data field storing weather information corresponding to an area of predetermined size in a simulated geographical environment of the computer game, said each first data field comprising a plurality of sub-data fields, each sub-field defining a weather layer.

12. The data structure of claim 11, wherein each weather layer is selected from a set of layer types including a surface condition layer, a temperature layer, a cloud layer, a visibility layer, and a wind layer.

13. The data structure of claim 12, wherein for a first cell the first data field comprises a plurality of sub-fields of the same layer type.

14. The data structure of claim 12, wherein for a first cell the first data field comprises two sub-fields having weather layers of the same altitude.

15. The data structure of claim 11, said data structure further comprising:
for each of the plurality of cells in the first two-dimensional grid, a second data field storing weather information corresponding to the area of predetermined size in the simulated

geographical environment of the computer game, said each second data field comprising a plurality of sub-data fields, each sub-data field defining a weather layer; and

an elapsed time data field indicating an amount of time between the weather information of each first data field and the weather information of each second data field.

15. The data structure of claim 12, wherein a first sub-field comprises a surface condition layer storing atmospheric pressure data, surface temperature data, dew point data, height data, surface wind speed data, surface wind direction data, surface wind gust data, surface wind variance data, surface wind shear data, and surface turbulence data.

16. The data structure of claim 12, wherein a first sub-field comprises a clouds layer storing cloud type data, cloud coverage data, cloud height data, cloud base data, precipitation type data, precipitation rate data, precipitation base data, icing data, and turbulence data.

17. The data structure of claim 12, wherein a first sub-field comprises a temperature layer storing altitude data, temperature data, and dew point data.

18. The data structure of claim 12, wherein a first sub-field comprises a visibility layer storing visibility data, base data, and height data.

19. The data structure of claim 12, wherein a first sub-field comprises a wind layer storing wind altitude data, wind speed data, wind direction data, wind gust data, wind variance data, wind shear data, and turbulence data.

20. A computer readable medium storing computer executable instructions for graphically depicting weather defined in a pre-existing weather profile to a simulated geographical environment in a computer game, comprising:

- a) reading a data structure storing predefined location neutral weather information, wherein the data structure comprises a plurality of weather layers for each cell in a two-dimensional array, wherein each cell corresponds to a simulated geographic area of predetermined size, and wherein the plurality of weather layers are selected from a set of layer types including a surface

condition layer, a cloud layer, a temperature layer, a wind layer, and a visibility layer;

- b) applying the weather layers read from the data structure to a grid within the simulated geographical environment of the computer game centered on a user's starting position within the computer game; and
- c) graphically depicting weather in the computer game, wherein the graphically depicted weather corresponds to the weather layers of a cell in which the user is currently located within the grid.